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For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: ENCAPSULATED FUNCTIONAL BAKERY INGREDIENTS

(57) Abstract: The present invention is concerned with lipid-encapsulated or lipid-coated functional bakery ingredients. More particularly, the invention relates to a granule suitable for use in the preparation of a dough, comprising: a. a hydrophilic core with a diameter of at least 5 µm, said core containing a functional bakery ingredient selected from the group of enzymes, oxidoreduc-  
tants, acidulants, hydrocolloids, starches, yeast, sugars, water, flavours and combinations thereof; and b. a lipophilic substantially continuous layer encapsulating the core, which layer contains at least 50 wt.% triglyceride fat with a slip melting point of at least 30°C and at least 1 wt.% of a release agent selected from the group of monoglycerides, diglycerides, diacetyl tartaric acid ester of mono and/or diglyceride (datem), stearyl-lactylates and combinations thereof. Other aspects of the invention relate to methods for preparing the aforementioned encapsulated or coated ingredients and the use of these lipid-encapsulated or lipid-coated ingredients in the preparation of a dough composition.

Int. Application No  
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**A. CLASSIFICATION OF SUBJECT MATTER**

IPC 7 A21D8/04 A21D2/02 A21D2/18 C12N9/98 A23P1/04  
A23L1/22 A23P1/08 A23L1/00 A21D2/14

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A21D C12N A23P A23L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, FSTA

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 008 309 A (NESTLE SA) 14 June 2000 (2000-06-14) paragraph '0018! - paragraph '0040! claims 1-7	1-15
X	WO 99/08553 A (OBEL LARS BERLIN ;KRINGELUM EJVIND WINDEL (DK); DANISCO (DK)) 25 February 1999 (1999-02-25) page 10, line 10 - page 15, line 17 page 16, line 29 - page 17 claims 1,2,18-21,31,32,48-50 -/-	1-16

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
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- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*&\* document member of the same patent family

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## INTERNATIONAL SEARCH REPORT

Int. Patent Application No.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98/32336 A (COTTRELL JOHN ;DALGETY PLC (GB); FRAZIER PETER (GB); SAXBY DAVID ()) 30 July 1998 (1998-07-30) page 1, line 23 - page 2, line 12 examples 1-4 claims 1-20 page 5, line 12 - page 6, line 26	1-16
X A	WO 01/11975 A (HORN MERRITT C) 22 February 2001 (2001-02-22) claims 1-20  page 9, line 17 - page 11, line 2	14  1-13,15, 16
X A	WO 02/19828 A (NOVOZYMES AS) 14 March 2002 (2002-03-14) page 7, line 14 - page 15, line 21  page 18, line 3 - page 22, line 7 claims 1-18,25,26,35	14  1-13,15, 16
A	WO 01/25411 A (NOVOZYMES AS) 12 April 2001 (2001-04-12) page 7, line 15 - page 11, line 4 page 22, line 20 - page 26, line 20 page 27, line 26 - page 30, line 23 claims 1-31	1-16
A	US 3 716 381 A (INAMINE S ET AL) 13 February 1973 (1973-02-13) cited in the application examples 1-4	1-16
X A	US 6 312 741 B1 (NAVARRO LUIS) 6 November 2001 (2001-11-06) column 3, line 36 - column 4, line 7  column 5, line 6 - column 6, line 33 claims 1-7	14  1,8, 10-13, 15,16
X A	GB 1 311 789 A (UENO FINE CHEMICAL IND) 28 March 1973 (1973-03-28) page 2, line 108 - page 3, line 73 example 9 claims 1,3,6	14  1,4,5, 10-13,16
X	US 4 511 584 A (PERKINS DOUGLAS W ET AL) 16 April 1985 (1985-04-16) column 2, line 66 - column 3, line 33; claims 1,4,8-11 column 4, line 28 - column 7, line 3 examples 1,2,4 claim 1	1,4,7,8, 10-14,16
	-/-	

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/NL 03/00711

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 034 125 A (ZIEMKE WILLIAM H ET AL) 5 July 1977 (1977-07-05) column 2, line 24 - column 3, line 30 examples I-XV, XVIII claims 1-8	1, 4-7, 10-15
A	US 2 978 332 A (FERRARI CHARLES G) 4 April 1961 (1961-04-04) column 1, line 58 - column 4, line 51 examples 1-4 claims 1-3, 6	1-16
A	WO 95/20328 A (FMC CORP) 3 August 1995 (1995-08-03) page 1, line 20 - page 7, line 31 page 9, line 14 - line 18 page 17, line 17 - page 19, line 8 example 16	1-16
A	EP 0 380 225 A (PFIZER) 1 August 1990 (1990-08-01) page 1, line 35 - page 3, line 5 examples 1-13 claims 1-10	1-16

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/NL 03/00711

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

As a result of the prior review under R. 40.2(e) PCT,  
no additional fees are to be refunded.

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:  
1-16, groups 1,3,4
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☒ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-16

Invention 1 relates to granules comprising enzymes.

2. claims: 1-16

Invention 2 relates to granules comprising oxidoreductants.

3. claims: 1-16

Invention 3 relates to granules comprising acidulants.

4. claims: 1-16

Invention 4 relates to granules comprising hydrocolloids.

5. claims: 1-16

Invention 5 relates to granules comprising starches.

6. claims: 1-16

Invention 6 relates to granules comprising yeast.

7. claims: 1-16

Invention 7 relates to granules comprising sugars.

8. claims: 1-16

Invention 8 relates to granules comprising water.

9. claims: 1-16

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Invention 9 relates to granules comprising flavours. The application relates to a plurality of inventions, or groups of inventions, in the sense of Rule 13.1 PCT. They have been divided as defined above. The requirement of unity shall be fulfilled only when there is a technical relationship among those inventions having one or more of the same or corresponding technical features. The expression "special technical feature" (SFT) shall mean those technical features that define a contribution over the prior art.

Claim 1 of the present application relates to a granule comprising a core containing one or more ingredients suitable for baking selected from the group of

1. enzymes, 2. oxidoreductants, 3. acidulants,
4. hydrocolloids, 5. starches, 6. yeasts, 7. sugars
8. water, 9. flavours

The core is encapsulated with a lipophilic coating having a specific composition. The only technical feature in common between all different groups is the lipid-coated core. This lipid-coated core is disclosed in US-3716381 (cited in the application). Said document discloses the coating of sorbic acid, an acidulant, with a mixture of a hardened oil and a monoglyceride (see ex 1-4). Hence, the Search Authority considers that claim 1 constitutes 9 different inventions: Claims 2-16 are either specific embodiments of the subject-matter of claim 1 (claims 2-10) or relate to compositions comprising the granule of claim 1 (claims 11 and 12), the use of the composition of claims 11 and 12 (claim 13) or the production of the granule (claims 15 and 16).

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/NL 03/00711

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1008309	A	14-06-2000	EP 1008309 A1 AT 234025 T DE 69812114 D1 DE 69812114 T2	14-06-2000 15-03-2003 17-04-2003 24-12-2003
WO 9908553	A	25-02-1999	AU 8797998 A WO 9908553 A1	08-03-1999 25-02-1999
WO 9832336	A	30-07-1998	AU 5670398 A EP 0966199 A2 WO 9832336 A2	18-08-1998 29-12-1999 30-07-1998
WO 0111975	A	22-02-2001	AU 6783500 A WO 0111975 A1 US 2002058086 A1	13-03-2001 22-02-2001 16-05-2002
WO 0219828	A	14-03-2002	AU 8381701 A WO 0219828 A1 US 2002094367 A1	22-03-2002 14-03-2002 18-07-2002
WO 0125411	A	12-04-2001	AU 7405200 A AU 7405400 A CN 1382212 T CN 1382213 T WO 0125411 A1 WO 0125412 A1 EP 1224272 A1 EP 1224273 A1 JP 2003511023 T	10-05-2001 10-05-2001 27-11-2002 27-11-2002 12-04-2001 12-04-2001 24-07-2002 24-07-2002 25-03-2003
US 3716381	A	13-02-1973	BE 712740 A DE 1767060 A1 FR 1557486 A GB 1176115 A NL 6804299 A ,B	31-07-1968 09-03-1972 14-02-1969 01-01-1970 30-09-1968
US 6312741	B1	06-11-2001	NONE	
GB 1311789	A	28-03-1973	NONE	
US 4511584	A	16-04-1985	US 4537784 A	27-08-1985
US 4034125	A	05-07-1977	AU 497778 B2 AU 2092376 A CA 1061174 A1 GB 1511200 A JP 52090645 A US 4141998 A	04-01-1979 29-06-1978 28-08-1979 17-05-1978 30-07-1977 27-02-1979
US 2978332	A	04-04-1961	NONE	
WO 9520328	A	03-08-1995	AU 685911 B2 AU 1690795 A CA 2182268 A1 EP 0785729 A1 JP 9502884 T WO 9520328 A1	29-01-1998 15-08-1995 03-08-1995 30-07-1997 25-03-1997 03-08-1995



# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/NL 03/00711

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0380225	A	01-08-1990	AT 134484 T	15-03-1996
			AU 615134 B2	19-09-1991
			AU 4884390 A	02-08-1990
			CA 2008314 A1	25-07-1990
			DE 69025480 D1	04-04-1996
			DE 69025480 T2	11-07-1996
			DK 380225 T3	18-03-1996
			EP 0380225 A2	01-08-1990
			ES 2083997 T3	01-05-1996
			GR 3019715 T3	31-07-1996
			IE 71931 B1	12-03-1997
			JP 1993228 C	22-11-1995
			JP 2242656 A	27-09-1990
			JP 7028696 B	05-04-1995
			KR 9207007 B1	24-08-1992
			MX 19235 A	01-10-1993
			PH 27047 A	01-02-1993
			US 5681601 A	28-10-1997
			US 5356644 A	18-10-1994
			ZA 9000520 A	28-08-1991